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(54) Adjustable dispensing closure

(57) An adjustable dispensing closure comprises a body 12 provided with an opening 20 and a lid member 14 formed with a number of openings 41–45 of different sizes. The lid member is rotatable relative to the body to permit regulated dispensing of the contents of the container. The lid member is held relative to the closure body by complementary annular beads 28, 30 for rotation through a full 360 degrees between closed and selected open positions.

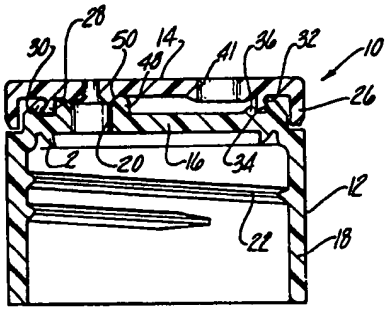

Fig-1

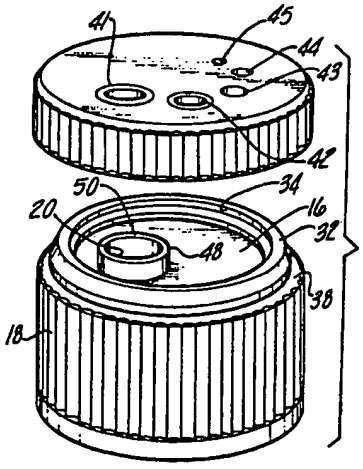

Fig-4

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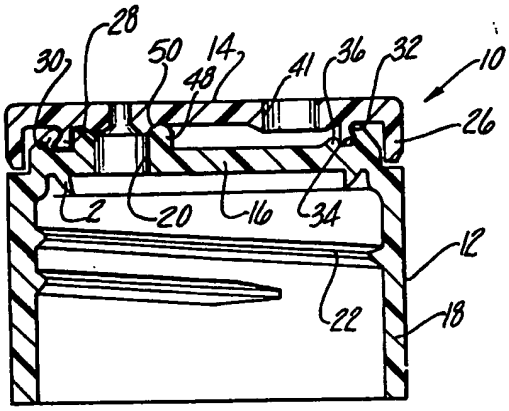
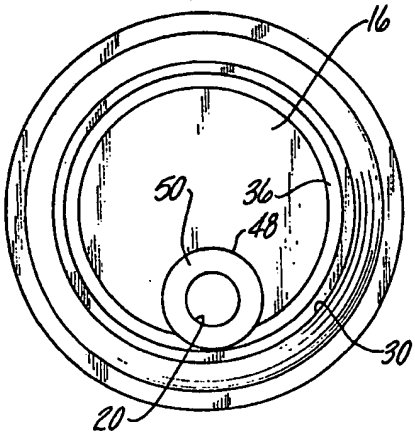


Fig-1

Fig-2



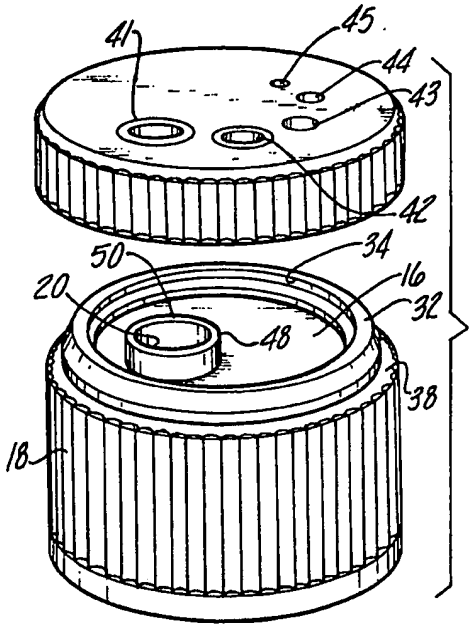


Fig-4

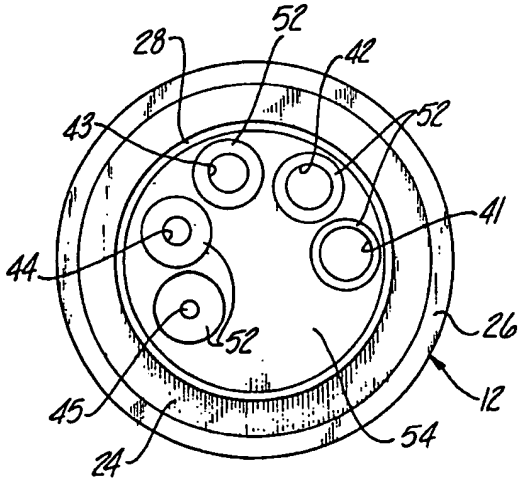


Fig-3

SPECIFICATION

Adjustable dispensing closure

The present invention relates to closures for containers and particularly to dispensing closures by which the contents of a container with which the closure is used are dispensed at a controlled rate.

Dispensing closures are frequently used with containers for a wide variety of products, usually liquids ranging widely in viscosity from edibles as syrup and ketchup to non-edibles such as liquid detergents and shampoos. It is frequently necessary for manufacturers who package several products having different viscosities to employ a variety of dispensing closures of different sizes to accommodate packaging of the different products. It would be highly desirable in such instances to have a single dispensing closure that could accommodate a variety of products of different viscosities by offering the possibility of varying the orifice or selecting an orifice of a particular size. Such a closure could also offer the consumer or purchaser a choice of a dispensing opening which is larger or smaller than the one recommended by the manufacturer.

The dispensing closure contemplated by the present invention includes a closure body adapted for attachment to a container and is formed with an opening of a predetermined size radially offset from the axis of the body to form a passage for the contents of the container. The opening is closed by a lid or cap member rotatably connected to the body. The lid member is provided with a plurality of openings having their axes radially offset relative to the axis of the lid member a distance equal to the distance of the opening in the closure body, with the plurality of openings progressively diminishing in size to provide a range of openings so that rotation of the lid member relative to the body member brings a selected one of the openings into alignment with the opening in the body to permit dispensing of the contents of the container.

A preferred embodiment of the invention is illustrated in the drawings in which:

Figure 1 is a cross-sectional view of a dispensing closure assembly embodying the invention;

Figure 2 is a top plan view of a closure body forming one element of a dispensing closure assembly;

Figure 3 is a bottom view of a lid member forming another element of the closure assembly; and

Figure 4 is an exploded perspective view of the two parts making up the dispensing closure of the present invention.

The adjustable dispensing closure embodying the present invention is designated generally at 10 and includes a closure body 12 and a cap or lid member 14. The closure body 12 and cap member 14 are generally cylindrical and have the same diameter.

The closure body 12 is generally cup-shaped with a top wall 15 and a depending cylindrical skirt 18. The top wall 16 is provided with a dispensing opening 20 through which the contents of the container with which the closure 10 is used are dispensed. The interior wall of the skirt 18 is provided with threads 22 by which the closure 10 may be attached to a container (not shown). Other forms of fastening means such as snap beads or adhesive may also be used to attach the closure 10 permanently to the container.

The underside of the top wall 16 is provided with an annular seal 23 which engages the top of the container opening to ensure that the contents of the container must pass through the opening 20.

The cap member 14 has a generally disc-shaped top with a depending skirt portion 26 having the same perimeter as the skirt 18 of the closure body 12. In the assembled condition of the closure body 12 and cap 14 as seen in Figure 2, the respective skirts 18 and 26 are in alignment with each other.

The body 12 and cap 14 are held in relatively rotatable relationship to each other by an annular bead 28 formed on the underside of the cap member 14 and a complementary annular bead 30 formed on the top wall 16 of the closure body 12. The annular bead 28 forms a radially outwardly facing groove 32 which receives the outer lip of the annular bead 30. Similarly, the annular bead 30 forms a radially inwardly facing groove 34 which receives the outer lip of the annular bead 28. The interlocking action of the annular beads 28 and 30 serves to maintain the closure body 12 and cap 14 in axially fixed relationship to each other and at the same time permits free rotation of the cap 14 relative to the body 12 by maintaining the skirt 26 axially spaced a slight amount from a shoulder 36 formed at the upper end of the skirt 18 and by maintaining a slight radial spacing between the inner surface of the skirt 26 and the closure body 12. Retention of the beads 28 and 30 in interlocking relationship with each other is further facilitated by an annular guide bead 36 seen in Figures 1 and 2 and formed on the top of the wall 16.

The interlocking beads 28 and 30 permit free rotation of the cap member 14 relative to the closure body 12 and at the same time maintain the body 12 and cap 14 in axially fixed relationship to each other with the skirt 26 radially spaced from the bead 32 and the bottom of the bead 26 is slightly spaced from a shoulder 38 formed at the top of the skirt 18 of the body 12.

The cap member 14 is provided with a plurality of openings 41, 42, 43, 44, and 45. The largest of the openings 41 corresponds generally in size to the opening 20 in the clo-

sure body 12 and the remaining openings progressively decreases in size to opening 45 which is the smallest of the openings. The opening 20 in the top wall 16 is surrounded by a collar 48 which has an annular seating surface 50 surrounding the opening. The seating surface 50 is complementary to a raised seating surface 52 which surrounds each of the openings on the cap member.

The opening 20 is offset a predetermined radial distance from the axis of the closure body 12 and similarly, the apertures 41 to 45 are disposed on an arc having a radius equal to the same predetermined distance so that upon rotation of the cap 14, selected ones of the openings or apertures come in alignment with the opening 20. A portion of the same arc indicated generally at 54 which is disposed between the largest of the openings 41 and the smallest of the openings 45 can be brought into alignment with the opening 20 to maintain it in a closed condition preventing the dispensing of the contents of the container with which the closure 10 is used.

After a container with which the closure 10 is used has been filled with its intended contents, the closure 10 is used by rotating the cap member 14 relative to the stationary closure body 12 to bring a selected one of the openings 41 to 45 into alignment with the opening 20 on the closure body 12. Upon selecting one of the openings, the closure body 12 and cap 14 are held in the selected relationship by the co-operation of the seating surface 52 surrounding the selected opening and the seat 50 in the collar 48.

CLAIMS

1. An adjustable-orifice dispensing closure comprising: a closure body adapted for attachment to a container and having an opening of a predetermined size radially offset a predetermined distance from the axis of the body, a lid member rotatably connected to the body and having a plurality of openings with their axes radially offset relative to the axis of the lid member a distance equal to said predetermined distance, the openings in the lid member progressively diminishing in size from a size substantially equal to the opening in the body to a predetermined minimum size whereby rotation of the lid member relative to the body permits alignment of a selected of the openings in the lid member with the opening in the body.

2. A dispensing closure according to claim 1 in which the closure body is generally cylindrical and the lid member is circular and has its periphery aligned with the periphery of the cylindrical body.

3. A dispensing closure according to claim 1 or claim 2 in which both the closure body and the lid member are generally cylindrical and have substantially equal diameters.

4. A dispensing closure according to any one of claims 1 to 3 in which the closure body has an annular ring and the lid member has a complementary annular ring engageable with the ring on the body to hold the body and lid member in axially fixed relationship permitting relative rotation between the body and lid member.

5. A dispensing closure according to claim 4 in which the lid member has an annular skirt coextensive with the cylindrical body and in which the skirt is radially spaced from the annular ring.

6. A dispensing closure according to any one of claims 1 to 5 in which the openings in the lid member are circular and have their axes on an arc having a radius equal to the said predetermined distance.

7. A dispensing closure according to claim 6 in which the closure portion is formed by the lid member on the remaining portion of the said arc not occupied by the apertures.

8. A dispensing closure according to any one of claims 1 to 7 in which the lid member has a skirt portion which defines the circumference of the lid member and is adjacent to but in axially and circumferentially spaced relationship to the closure body.

9. A dispensing closure according to any one of claims 1 to 8 in which the opening in the closure body is surrounded by a seating surface and in which each of the openings in the lid member is provided with seat portion complementary to that seating surface.

10. A dispensing closure according to claim 9 in which the seating portions are raised from the surface of the lid member to engage the seating surface and resiliently resist rotation of the lid member relative to the closure body.

11. An adjustable dispensing closure assembly for dispensing the contents of a container to which it is attached and comprising: a cap member, with an opening therethrough, and a lid member equipped with a plurality of openings therethrough and carried by the cap member, whereby the lid member may selectively align one of its openings with the opening in the cap member to permit the regulated dispensing of the contents of the container.

12. An adjustable dispensing closure assembly according to claim 11 in which the lid member is a snap fit on the cap member.

13. An adjustable dispensing closure assembly according to claim 11 or claim 12 which the cap member is equipped with an undercut annular bead and the lid member is equipped with an interior skirt means whereby the lid member is rotatably carried on the cap member to allow an operator to selectively bring an opening on the lid member into alignment with the cap opening to dispense said contents in a regulated, controlled manner.

14. An adjustable dispensing closure assembly according to any one of claims 11 to

13 in which the cap member is secured to the container by a screw threaded engagement.

15. An adjustable dispensing closure assembly according to any one of claims 11 to 13 in which the cap member is secured to the container by means of an annular bead.

16. An adjustable dispensing closure assembly according to any one of claims 11 to 15 in which the lid member is selectively rotatable through 360 degrees.

17. An adjustable dispensing closure assembly according to any one of claims 11 to 16 in which the openings in the lid member and the opening in the cap are located along the periphery of the respective members, whereby rotating the lid member selectively brings its openings into alignment with the opening in the cap.

18. An adjustable-orifice dispensing closure substantially as described with reference to the accompanying drawings.

CLAIMS

New claims or amendments to claims filed on 26th November 1986.

Superseded claims 1 and 9 to 18. New or amended claims:—1 and 9 to 15.

1. A two piece adjustable orifice dispensing closure comprising a closure body adapted for attachment to a container, having a top wall containing an opening of a predetermined size radially offset a predetermined distance from the axis of the body, an annular sealing surface surrounding the opening and raised above the top wall, and a lid member rotatably connected to the body, the lid member having a plurality of apertures with their axes radially offset relative to the axis of the lid member by a distance equal to said predetermined distance, the plurality of apertures progressively diminishing in size from a size substantially equal to that of the opening in the top wall to a predetermined minimum size, raised annular sealing seats surrounding each of the apertures, each seat being complementary to the sealing surface independent of the aperture size whereby rotation of the lid member relative to the body permits alignment of a selected one of the apertures with the opening in the body whereupon one of the sealing seats engages the sealing surface resiliently to resist rotation of the lid member relative to the closure body.

9. An adjustable dispensing closure assembly for dispensing the contents of a container to which it is to be attached comprising a cap member with an opening therethrough equipped with an undercut annular bead, and a lid member equipped with a plurality of openings therethrough and an interior skirt means whereby the lid member is rotably carried on the cap member thereby allowing an operator to selectively bring an opening on the lid member into alignment with the cap opening to dispense the contents in a regulated, controlled manner.

10. An adjustable dispensing closure assembly according to claim 9 in which the lid member is a snap fit on the cap member.

11. An adjustable dispensing closure assembly according to claim 9 or claim 10 in which the cap member is secured to the container by a screw threaded engagement.

12. An adjustable dispensing closure assembly according to any one of claims 9 to 11 in which the cap member is secured to the container by means of an annular bead.

13. An adjustable dispensing closure assembly according to any one of claims 9 to 12 in which the lid member is selectively rotatable through 360 degrees.

14. An adjustable dispensing closure assembly according to any one of claims 9 to 13 in which the openings in the lid member and the opening in the cap are located along the periphery of the respective members, whereby rotating the lid member selectively brings its openings into alignment with the opening in the cap.

15. An adjustable-orifice dispensing closure substantially as described with reference to the accompanyfng drawings.

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